

Substructured, Meshless and Parametric Modeling of Vibroacoustic Systems, Phase I

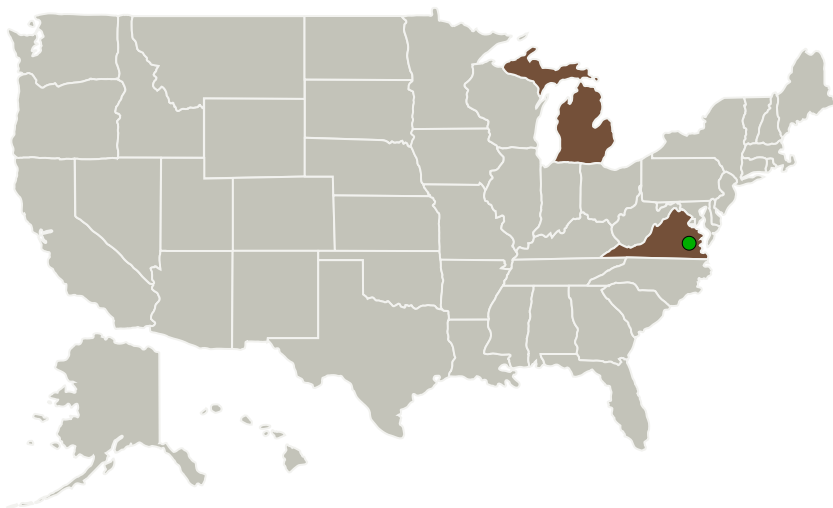
Completed Technology Project (2013 - 2013)



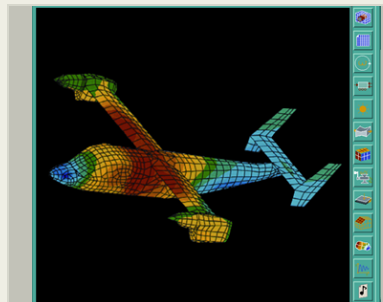
Project Introduction

Aerospace structures are often subjected to a broad spectrum of mechanical and/or aerodynamic excitations and, therefore, there is a real need for the development of a modeling technique which can be used for the vibroacoustic analysis, with high fidelity and adequate spatial and spectral resolutions, of complex systems over the entire frequency range. A dynamic system typically exhibits distinctively different response characteristics as frequency increases. In recognizing the complicated behavior of a structure, the modeling methods in dynamic analysis are usually classified into low, mid, and high frequency models. A substructure-based modeling technique, based on enhanced Fourier Spectral Element Method (FSEM), that is applicable all frequencies, is proposed for the modeling of complex dynamic systems. This method also does not require meshing as is traditionally used in discretization methods such as finite and boundary element methods.

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
Comet Technology Corporation	Lead Organization	Industry	Ann Arbor, Michigan
● Langley Research Center(LaRC)	Supporting Organization	NASA Center	Hampton, Virginia



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Primary U.S. Work Locations

Michigan

Virginia

Project Transitions

May 2013: Project Start

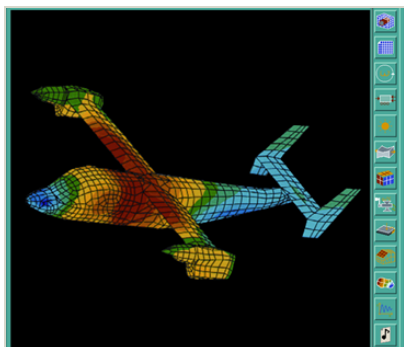
November 2013: Closed out

Closeout Summary: Substructured, Meshless and Parametric Modeling of Vibroacoustic Systems, Phase I Project Image

Closeout Documentation:

- Final Summary Chart Image(<https://techport.nasa.gov/file/137429>)

Images



Briefing Chart Image

Substructured, Meshless and Parametric Modeling of Vibroacoustic Systems, Phase I
(<https://techport.nasa.gov/image/130333>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Comet Technology Corporation

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

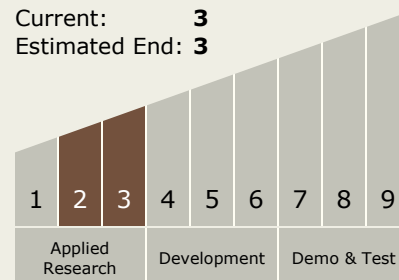
Carlos Torrez

Principal Investigator:

Satha Raveendra

Technology Maturity (TRL)

Start: 2
Current: 3
Estimated End: 3



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Technology Areas

Primary:

- TX12 Materials, Structures, Mechanical Systems, and Manufacturing
 - └ TX12.5 Structural Dynamics
 - └ TX12.5.2 Vibroacoustics

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System